

CLAIMS:

1. A wheel for mounting on a vehicle, the wheel comprising a polymer reinforced with up to approximately 50% of fibers.

2. The wheel as set forth in claim 1, wherein the polymer is a toughened nylon.

3. The wheel as set forth in claim 1, wherein the fibers are glass fibers.

4. The wheel as set forth in claim 1, wherein the fibers are carbon fibers.

5. The wheel as set forth in claim 1, wherein the fibers are kevlar fibers.

6. The wheel as set forth in claim 1, wherein the wheel is cross-sectionally thickest near a center portion of the wheel and tapers to diminishing cross-sectional thickness thereoutward.

7. The wheel as set forth in claim 1, further comprising a plurality of stiffening ribs.

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8 X<sup>76</sup> A wheel for mounting on a vehicle, the wheel comprising a fiber reinforced toughened nylon including up to approximately 50% of fibers selected from the group consisting of: glass fibers, carbon fibers, and kevlar fibers, and comprising a plurality of stiffening ribs, and wherein the wheel is cross-sectionally thickest near a center portion of the wheel and tapers to diminishing cross-sectional thickness thereoutward.

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<sup>9</sup>  
~~8~~<sup>9</sup> A modular wheel for mounting on a vehicle, the wheel comprising:  
an inboard wheel half;  
an outboard wheel half;

5 a center section interposed between and separably coupled with the inboard wheel half and the outboard wheel half; and  
a first bead lock ring having a first bead lock surface, wherein the wheel presents a second bead lock surface such that the first bead lock surface and the second bead lock surface cooperate to facilitate sealing a first bead of a tire therebetween.

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~~9~~<sup>10</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the inboard wheel half includes a plurality of stiffening ribs.

<sup>11</sup>  
~~10~~<sup>11</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the inboard wheel half presents an exterior surface having a circumferential raised rib operable to facilitate retaining a tire on the wheel.

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~~11~~<sup>12</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the outboard wheel half includes a plurality of stiffening ribs.

<sup>13</sup>  
~~12~~<sup>13</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the outboard wheel half and the inboard wheel half are constructed from a polymer.

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~~13~~<sup>14</sup> The modular wheel as set forth in claim ~~12~~<sup>13</sup>, wherein the polymer is a toughened nylon.

<sup>15</sup>  
~~14~~<sup>15</sup> The modular wheel as set forth in claim ~~12~~<sup>13</sup>, wherein the polymer is reinforced with up to approximately 50% of fibers selected from the group consisting of: carbon fibers, glass fibers, and kevlar fibers.

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~~15~~.<sup>16</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the center section is constructed from aluminum.

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~~16~~.<sup>17</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the center section is constructed from magnesium.

<sup>18</sup>  
~~17~~.<sup>18</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the center section is constructed from a polymer and includes a compression limiting insert.

<sup>19</sup>  
~~18~~.<sup>19</sup> The modular wheel as set forth in claim ~~17~~<sup>18</sup>, wherein the compression limiting insert is molded into the polymer.

<sup>20</sup>  
~~19~~.<sup>20</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the center section presents a first center section contact surface for close contact with a corresponding contact surface of the inboard wheel half, and presents a second center section contact surface for close contact with a corresponding contact surface of the outboard wheel half, and the first center section contact surface and the second center section contact surface includes a groove for receiving an O-ring seal.

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~~20~~.<sup>21</sup> The modular wheel as set forth in claim ~~8~~<sup>9</sup>, wherein the center section presents a first center section contact surface for close contact with a corresponding contact surface of the inboard wheel half, and presents a second center section contact surface for close contact with a corresponding contact surface of the outboard wheel half, and the first center section contact surface and the second center section contact surface includes a groove for receiving a dynamic u-cup seal.

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The modular wheel as set forth in claim 8<sup>9</sup>, wherein the first bead lock surface presents a first portion of an alignment mechanism, and the second bead lock surface presents a second portion of the alignment mechanism, wherein the first portion and the second portion of the alignment mechanism cooperate to align a first bolt hole in the first bead lock surface with a second bolt hole in the second bead lock surface.

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The modular wheel as set forth in claim 8<sup>9</sup>, further comprising a second bead lock ring having a third bead lock surface, wherein the wheel presents a fourth bead lock surface such that the third bead lock surface and the fourth bead lock surface cooperate to facilitate sealing a second bead of the tire therebetween.

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The modular wheel as set forth in claim 8<sup>9</sup>, further comprising a mud plug positioned within the outboard wheel half and operable to prevent substantial entry thereinto of mud and debris.

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The modular wheel as set forth in claim 23<sup>24</sup>, wherein the mud plug is removably secured within the outboard wheel half using a quick release fastener.

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A modular wheel for mounting on a vehicle, the wheel comprising:  
an inboard wheel half having a first plurality of stiffening ribs and having a circumferential raised rib operable to facilitate retaining a tire on the wheel;

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an outboard wheel half having a second plurality of stiffening ribs and a first bead lock surface presenting a first bolt hole and a first portion of an alignment mechanism;

a center section interposed between and separably coupled with the inboard wheel half and the outboard wheel half;

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a bead lock ring having a second bead lock surface presenting a second bolt hole and a second portion of the alignment mechanism, wherein the first portion cooperates with the second portion to thereby align the first bolt hole of the first bead lock surface with the second bolt hole of the second bead lock surface; and

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a mud plug removably secured within the outboard wheel half using a quick release fastener, and operable to prevent substantial entry thereto of mud and debris.

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The modular wheel as set forth in claim 25, wherein the center section presents a first center section contact surface for close contact with a corresponding contact surface of the inboard wheel half, and presents a second center section contact surface for close contact with a corresponding contact surface of the outboard wheel half, and the first center section contact surface and the second center section contact surface includes a groove for receiving an O-ring seal.

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The modular wheel as set forth in claim 25, wherein the center section presents a first center section contact surface for close contact with a corresponding contact surface of the inboard wheel half, and presents a second center section contact surface for close contact with a corresponding contact surface of the outboard wheel half, and the first center section contact surface and the second center section contact surface includes a groove for receiving a dynamic u-cup seal.

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A wheel for mounting on a vehicle, the wheel comprising:  
a wheel body including an inboard portion and an outboard portion; and  
a first bead lock ring having a first bead lock surface, wherein the wheel  
presents a second bead lock surface such that the first bead lock  
surface and the second bead lock surface cooperate to facilitate  
sealing a first bead of a tire therebetween.

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The wheel as set forth in claim 28, wherein the inboard wheel portion  
includes a plurality of stiffening ribs.

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The wheel as set forth in claim 28, wherein the inboard wheel portion  
presents an exterior surface having a circumferential raised rib operable to facilitate  
retaining a tire on the wheel.

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The wheel as set forth in claim 28, wherein the outboard wheel portion  
includes a plurality of stiffening ribs.

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The wheel as set forth in claim 28, wherein the wheel body is  
substantially constructed from a polymer.

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The wheel as set forth in claim 32, wherein the polymer is a toughened  
nylon.

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The wheel as set forth in claim 32, wherein the polymer is reinforced  
with up to approximately 50% of fibers selected from the group consisting of: carbon  
fibers, glass fibers, and kevlar fibers.

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<sup>35</sup> 36. The wheel as set forth in claim <sup>29</sup> 28, wherein the first bead lock surface presents a first portion of an alignment mechanism, and the second bead lock surface presents a second portion of the alignment mechanism, wherein the first portion and the second portion of the alignment mechanism cooperate to align a first bolt hole in the first bead lock surface with a second bolt hole in the second bead lock surface.

<sup>37</sup> 36. The wheel as set forth in claim <sup>29</sup> 28, further comprising a second bead lock ring having a third bead lock surface, wherein the wheel presents a fourth bead lock surface such that the third bead lock surface and the fourth bead lock surface cooperate to facilitate sealing a second bead of the tire therebetween.

<sup>38</sup> 37. The wheel as set forth in claim <sup>29</sup> 28, further comprising a mud plug positioned within the outboard wheel portion and operable to prevent substantial entry thereinto of mud and debris.

<sup>39</sup> 38. The wheel as set forth in claim <sup>30</sup> 37, wherein the mud plug is removably secured within the outboard wheel half using a quick release fastener.



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A wheel for mounting on a vehicle, the wheel comprising:  
a first bead lock surface presenting a first bolt hole and presenting a first  
portion of an alignment mechanism; and

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a bead lock ring having a second bead lock surface and presenting a second  
bolt hole and a second portion of the alignment mechanism,

wherein the first portion of the alignment mechanism cooperates with the  
second portion to thereby align the first bolt hole of the first bead lock  
surface with the second bolt hole of the second bead lock surface,  
and the first bead lock surface and the second bead lock surface  
cooperate to facilitate sealing a bead of a tire therebetween.

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The wheel as set forth in claim 39, wherein the alignment mechanism  
includes a projection and a corresponding slot, wherein the projection fits within the  
corresponding slot.

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The wheel as set forth in claim 39, wherein the first bolt hole is  
internally threaded.

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The wheel as set forth in claim 39, wherein the bead lock ring presents  
an outer surface, and the second bolt hole is countersunk within the outer surface.

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The wheel as set forth in claim 39, further including a taper on the  
second bead lock surface operable to properly align the bead of the tire thereon.

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A wheel for mounting on a vehicle, the wheel comprising:  
an outboard cavity through which access is had to a mechanism for  
removably coupling the wheel with the vehicle; and  
a mud plug removably secured to the wheel half using a quick release  
fastener, and operable to substantially prevent entry of mud and  
debris into the outboard cavity.

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The wheel as set forth in claim 44, wherein the mud plug includes a  
mounting tab removably secured to the wheel, and a mud shield removably secured  
to the mounting tab.

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The wheel as set forth in claim 44, wherein the quick release fastener  
is a quarter-turn fastener.

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The wheel as set forth in claim 44, wherein the mud plug is provided  
with a center hole for accommodating an axle of the vehicle.

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